What is claimed is:

1. A method for preparing an aqueous fluid for use in a subterranean formation, comprising:

combining one or more monomers with a cross-linking agent and an initiator;

polymerizing the monomers in the presence of the cross-linking agent to form synthetic, crosslinked polymer gels that have an average particle size less than about 100 microns; and

combining the synthetic, crosslinked polymer gels with water to form an aqueous fluid.

2. The method of claim 1 wherein the aqueous fluid further comprises solids.

3. The method of claim 2 wherein the synthetic, crosslinked polymer gels block the interstitial spaces among the solids so as to form a filter cake in the subterranean formation.

4. The method of claim 3 wherein the solids comprise calcium carbonate, silica, barite, a clay, or mixtures thereof.

5. The method of claim 1 wherein the monomer is a synthetic monomer capable of polymerizing.

6. The method of claim 4 wherein the monomer is a monomer of a weak acid or a weak base.

7. The method of claim 1 wherein the monomer comprises a monomer selected from the group consisting of methacrylic acid, acrylic acid, butyl acrylate, ethyl acrylate, methyl methacrylate, dimethyl ethyl amino methacrylate, acrylamide, or 2-acrylamide-2-methyl-1-propanesulfonic acid, an epoxide, and combinations thereof.

8. The method of claim 1 wherein the monomer comprises methacrylic acid and/or butyl acrylate.

9. The method of claim 1 wherein the initiator comprises a free radical initiator, an azo compound, a percarbonate, a metal-catalyzed peroxide system, or radiation.

10. The method of claim 8 wherein the initiator is a free radical initiator, and wherein the free radical initiator comprises a material selected from the group consisting of: ammonium persulfate, sodium persulfate, potassium persulfate, and combinations thereof.

11. The method of claim 8 wherein the free radical initiator comprises potassium persulfate.

12. The method of claim 1 wherein the crosslinking agent comprises a molecule having two or more vinyl chemical groups.

13. The method of claim 1 wherein the crosslinking agent comprises a material selected from the group consisting of N,N-methylenebisacrylamide and divinyl benzene.

14. The method of claim 1 wherein the crosslinking agent comprises divinyl benzene.

15. The method of claim 1 wherein the step of polymerizing the monomers comprises an emulsion polymerization reaction.

16. The method of claim 15 wherein the reaction is a water-in-oil emulsion polymerization.

17. The method of claim 15 wherein the reaction is an oil-in-water emulsion polymerization.

18. The method of claim 15 wherein the synthetic, crosslinked polymer gels comprise alkali swellable latexes.

19. The method of claim 18 wherein the average particle size of the synthetic, crosslinked polymer gels decreases as the pH of the subterranean formation decreases.

20. The method of claim 19 wherein the synthetic, crosslinked polymer gels have a diameter, and wherein the increase of the average particle size constitutes an increase in the diameter of up to about 10 times the original diameter.

21. The method of claim 1 wherein the synthetic, crosslinked polymer gels have an average particle size in the range of from about 0.1 micron to about 100 micron.

22. The method of claim 1 wherein the synthetic, crosslinked polymer gels have an average particle size in the range of from about 0.1 micron to about 50 micron.

23. The method of claim 1 wherein:

the monomer comprises a monomer selected from the group consisting of methacrylic acid, acrylic acid, butyl acrylate, ethyl acrylate, methyl methacrylate, dimethyl ethyl amino methacrylate, acrylamide, or 2-acrylamide-2-methyl-1-propanesulfonic acid, an epoxide, and combinations thereof;

the crosslinking agent comprises a molecule having two or more vinyl chemical groups; and

the initiator comprises a free radical initiator.

24. The method of claim 23 wherein the crosslinking agent comprises a material selected from the group consisting of N,N-methylenebisacrylamide and divinyl benzene.

25. The method of claim 23 wherein

the monomer comprises methacrylic acid and a material selected from the group consisting of butyl acrylate, a sulfonate, and 2-acrylamide-2-methyl-1-propanesulfonic acid;

the crosslinking agent comprises divinyl benzene; and

the initiator comprises a free radical initiator.

26. The method of claim 25 wherein the free radical initiator comprises potassium persulfate, ammonium persulfate, or sodium persulfate.

27. The method of claim 23 wherein the step of polymerizing is carried out in a water in oil emulsion.

28. The method of claim 23 wherein the step of polymerizing is carried out in an oil in water emulsion.

29. A method for treating a subterranean formation penetrated by a well bore comprising the step of:

contacting a subterranean formation with an aqueous treating fluid comprising a synthetic, crosslinked polymer gel so as to form a filter cake therein, wherein the synthetic, crosslinked polymer gel has an average particle size less than about 100 microns.

30. The method of claim 29 wherein the synthetic, crosslinked polymer gel is produced from a reaction involving one or more monomers, a crosslinking agent, and an initiator.

31. The method of claim 29 wherein the aqueous treating fluid further comprises solids selected from the group consisting of calcium carbonate, silica, barite, clay, and mixtures thereof.

32. The method of claim 30 wherein one monomer is a synthetic monomer capable of polymerizing.

33. The method of claim 32 wherein the monomer is a monomer of a weak acid or a weak base.

34. The method of claim 30 wherein the monomer comprises a monomer selected from the group consisting of methacrylic acid, acrylic acid, butyl acrylate, ethyl acrylate, methyl methacrylate, dimethyl ethyl amino methacrylate, acrylamide, or 2-acrylamide-2-methyl-1-propanesulfonic acid, an epoxide, and combinations thereof.

35. The method of claim 30 wherein the monomer comprises methacrylic acid and butyl acrylate.

36. The method of claim 30 wherein the initiator comprises a free radical initiator, an azo compound, a percarbonate, a metal-catalyzed peroxide system, or radiation.

37. The method of claim 36 wherein the initiator comprises a free radical initiator, and wherein the free radical initiator comprises a material selected from the group consisting of: ammonium persulfate, sodium persulfate, potassium persulfate, and combinations thereof.

38. The method of claim 36 wherein the free radical initiator comprises potassium persulfate.

39. The method of claim 30 wherein the crosslinking agent comprises a molecule having two or more vinyl chemical groups.

40. The method of claim 30 wherein the crosslinking agent comprises a material selected from the group consisting of N,N-methylenebisacrylamide and divinylbenzene.

41. The method of claim 40 wherein the crosslinking agent comprises divinyl benzene.

42. The method of claim 30 wherein the reaction comprises an emulsion polymerization reaction.

43. The method of claim 42 wherein the reaction is a water-in-oil emulsion polymerization.

44. The method of claim 42 wherein the reaction is an oil-in-water emulsion polymerization.

45. The method of claim 42 wherein the synthetic, crosslinked polymer gels comprise alkali swellable latexes.

46. The method of claim 45 wherein the average particle size of the synthetic, crosslinked polymer gels decreases as the pH of the subterranean formation decreases.

47. The method of claim 46 wherein the synthetic, crosslinked polymer gels have a diameter, and wherein the increase of the average particle size constitutes an increase in the diameter of up to about 10 times the original diameter.

48. The method of claim 29 wherein the synthetic, crosslinked polymer gel particles have an average particle size in the range of from about 0.1 micron to about 100 microns.

49. The method of claim 29 wherein the synthetic, crosslinked polymer gel particles have an average particle size in the range of from about 0.1 micron to about 50 microns.

50. The method of claim 30 wherein:

the monomer comprises a monomer selected from the group consisting of methacrylic acid, acrylic acid, butyl acrylate, ethyl acrylate, methyl methacrylate, dimethyl ethyl amino methacrylate, acrylamide, or 2-acrylamide-2-methyl-1-propanesulfonic acid, an epoxide, and combinations thereof;

the crosslinking agent comprises a molecule having two or more vinyl chemical groups; and

the initiator comprises a free radical initiator.

51. The method of claim 50 wherein the crosslinking agent comprises a material selected from the group consisting of N,N-methylenebisacrylamide and divinylbenzene.

52. The method of claim 50 wherein

the monomer comprises methacrylic acid and a material selected from the group consisting of a sulfonate, butyl acrylate, and 2-acrylamide-2-methyl-1-propanesulfonic acid;

the crosslinking agent comprises divinyl benzene; and

the initiator comprises a free radical initiator.

53. The method of claim 52 wherein the free radical initiator comprises potassium persulfate, ammonium persulfate, or sodium persulfate.

54. The method of claim 52 wherein the reaction is carried out in a water in oil emulsion.

55. The method of claim 52 wherein the reaction is carried out in an oil in water emulsion.

56. An aqueous fluid useful in subterranean well operations, comprising synthetic, crosslinked polymer gels having an average particle size less than about 100 microns.

57. The fluid of claim 56 further comprising solids selected from the group consisting of calcium carbonate, silica, barite, and clays.

58. The fluid of claim 57 wherein the synthetic, crosslinked polymer gels are capable of blocking the interstitial spaces among the solids so as to form a filter cake in a subterranean formation.

59. The fluid of claim 56 wherein the synthetic, crosslinked polymer gels have an average particle size in the range of from about 0.1 micron to about 100 microns.

60. The fluid of claim 56 wherein the synthetic, crosslinked polymer gels have an average particle size in the range of from about 0.1 micron to about 50 microns.

61. The fluid of claim 56 wherein the synthetic, crosslinked polymer gels are formed from synthetic monomers capable of polymerizing.

62. The fluid of claim 61 wherein the synthetic, crosslinked polymer gels are formed from a monomer of a weak acid and/or a monomer of a weak base.

63. The fluid of claim 56 wherein the synthetic, crosslinked polymer gel particles are formed from a monomer selected from the group consisting of methacrylic acid, acrylic acid, butyl acrylate, ethyl acrylate, methyl methacrylate, dimethyl ethyl amino methacrylate, acrylamide, or 2-acrylamide-2-methyl-1-propanesulfonic acid, an epoxide, and combinations thereof.

64. The fluid of claim 56 wherein the synthetic, crosslinked polymer gels are formed from crosslinking agents that comprise a molecule having two or more vinyl chemical groups.

65. The fluid of claim 64 wherein the crosslinking agent comprises a material selected from the group consisting of N,N-methylenebisacrylamide and divinylbenzene.

66. The fluid of claim 64 wherein the crosslinking agent comprises divinyl benzene.

67. The fluid of claim 56 wherein the synthetic, crosslinked polymer gels are produced from an emulsion polymerization reaction.

68. The fluid of claim 67 wherein the reaction is a water-in-oil emulsion polymerization.

69. The fluid of claim 67 wherein the reaction is an oil-in-water emulsion polymerization.

70. The fluid of claim 67 wherein the synthetic, crosslinked polymer gels comprise alkali swellable latexes.

71. The fluid of claim 70 wherein the average particle size of the synthetic, crosslinked polymer gels decreases as the pH in a subterranean environment decreases.

72. The fluid of claim 71 wherein the synthetic, crosslinked polymer gels have a diameter, and wherein the increase of the particle size constitutes an increase in the diameter of up to about 10 times the original diameter.

73. The fluid of claim 56 wherein

the synthetic, crosslinked polymer gels are formed from monomers that comprise materials selected from the group consisting of methacrylic acid, acrylic acid, butyl acrylate, ethyl acrylate, methyl methacrylate, dimethyl ethyl amino methacrylate, acrylamide, or 2-acrylamide-2-methyl-1-propanesulfonic acid, an epoxide, and combinations thereof;

the synthetic, crosslinked polymer gels are formed from crosslinking agents that comprise materials selected from the group consisting of N,N-methylenebisacrylamide and divinylbenzene; and

the synthetic, crosslinked polymer gels have an average particle size in the range of from about 0.1 micron to about 100 microns.